Do We Need More Frequent Data to Measure Health Out-of-Pocket Expenditures?

Patrick Eozenou, Gil Shapira, and Asiyeh Abassi
World Bank
Health, Nutrition and Population

The Pulse of Progress:
Harnessing High-Frequency Survey Data for Development Research in the Polycrisis Era

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Outline

1. Motivations: Why do we care about health out-of-pocket (OOP) expenditures?

2. Measurement issues.

3. High-Frequency Phone Surveys (Burkina, Ethiopia, Malawi, Nigeria, Uganda).

4. Characterization of health spending patterns (frequency, size, and composition).

5. Annualization approaches comparisons.

Motivation: Health Out-of-Pocket Spending

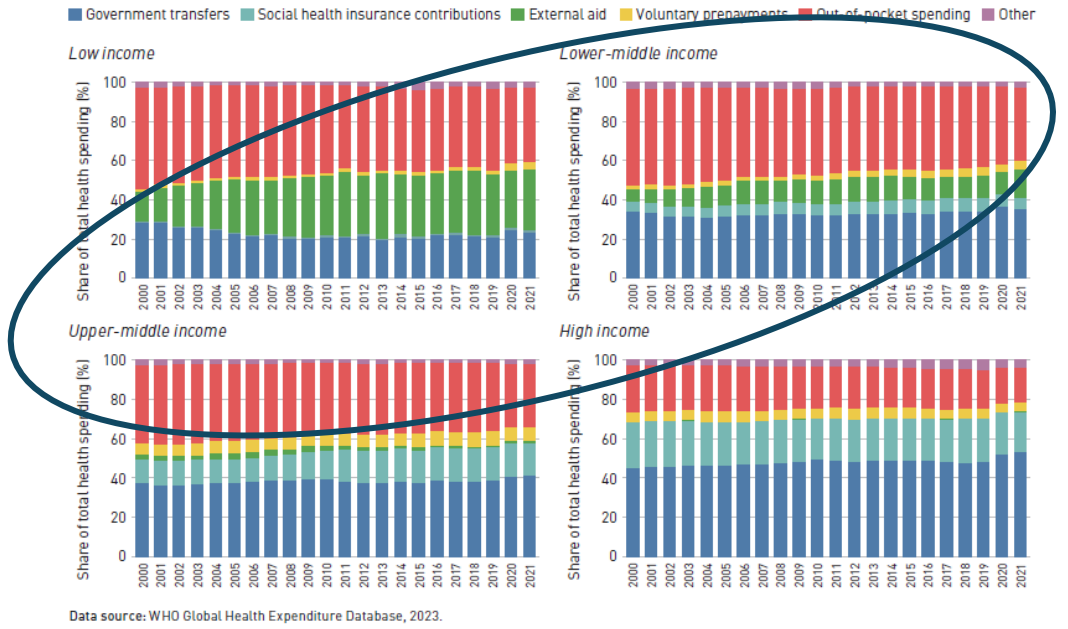
Universal Health Coverage

- Universal Health Coverage (UHC) is a key part of the Sustainable Development Goals (SDGs) and is tracked by the World Health Organization (WHO) and the World Bank (SDG 3.8).
- **Universal health coverage (UHC) is the idea that everyone should have access to essential quality health services without suffering from financial hardship.**
- Financial hardship from health spending is typically measured by focusing on health out-of-pocket (OOP) expenditures:
  - Share of population spending more than a given spending threshold in proportion of total consumption.
  - Share of population pushed under the poverty line due to health OOP spending.

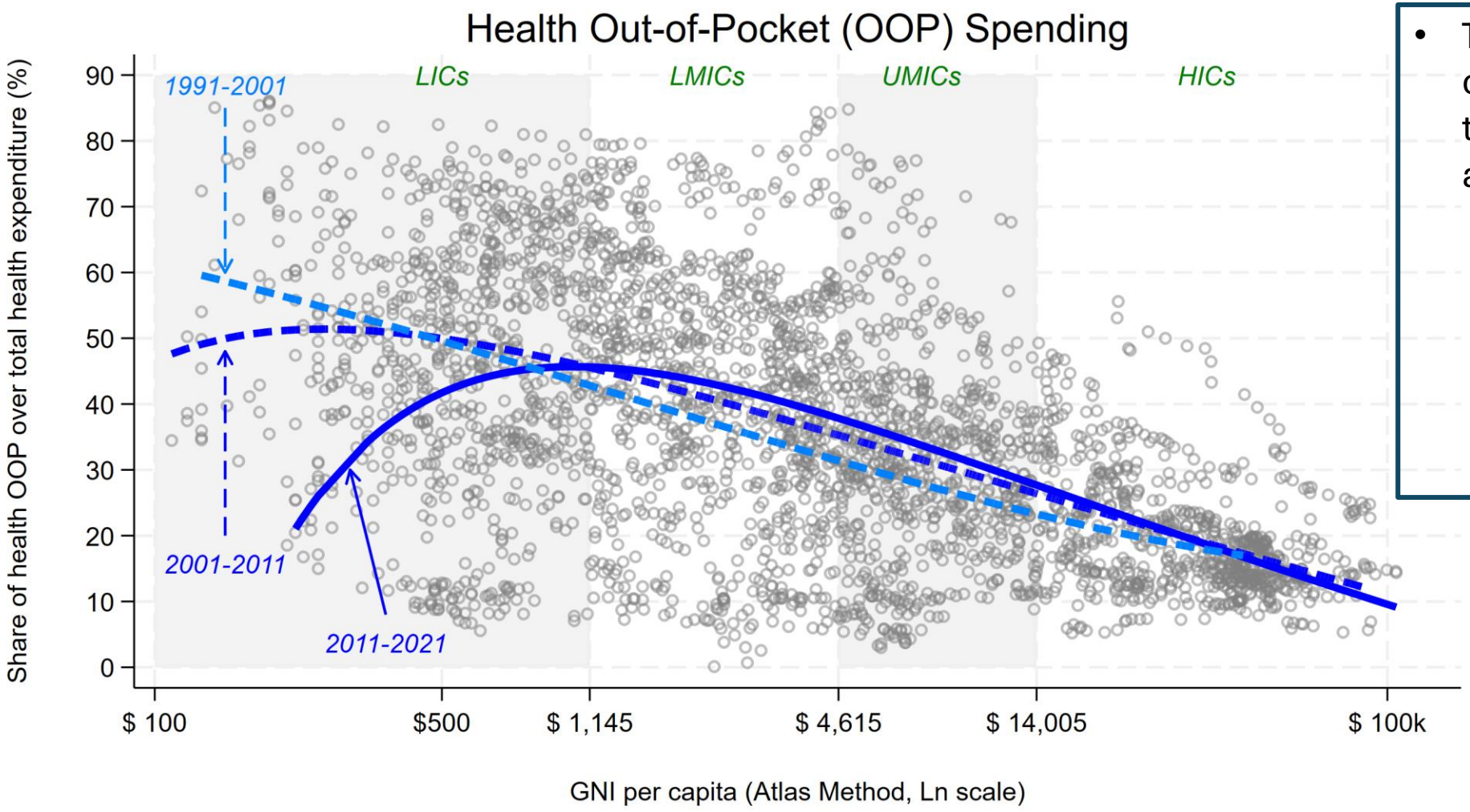
Health Financing

- In addition to financial hardship, health OOP spending is also not an efficient way of financing health.
  - Akin to taxing the sick population.
  - Welfare gains related to risk pooling are not realized (ex-post payment).
  - Health is a public good with externalities, so private funding is usually insufficient to support adequate provision from a social perspective.

OOP funding still represents between 30%-40% of total health funding in low- and middle-income countries.



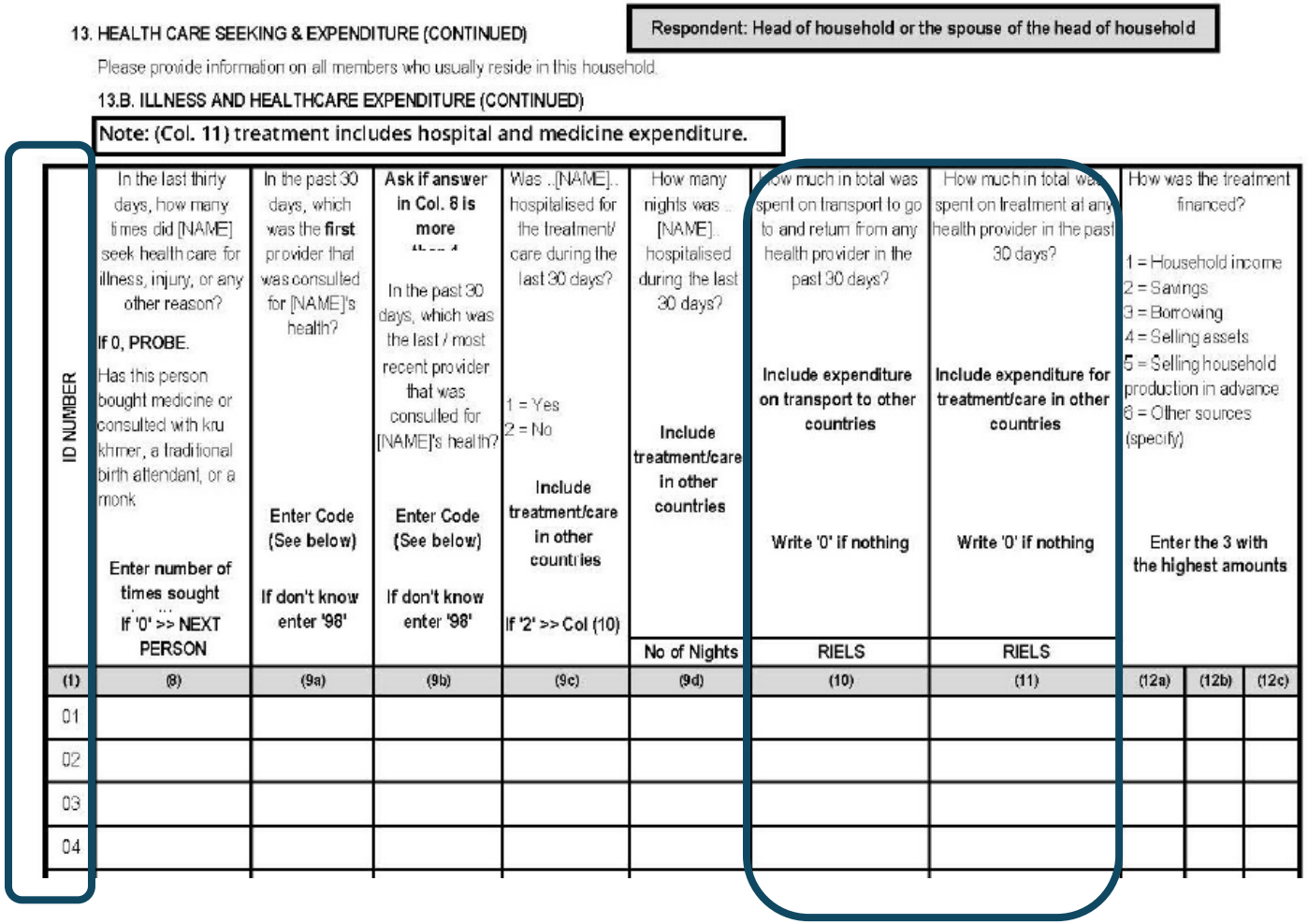
Motivation: Health Out-of-Pocket Spending



- The share of OOP spending over total health expenditure tends to decline with aggregate income, but:
  - Heterogeneity across countries is large.
  - The shape of the curve has changed over the past 3 decades for LICs.

Source: WHO (2024) GLobal Health Expenditure Database and World Bank (2024) World Development Indicators.

How are health OOP expenditure measured?



13. HEALTH CARE SEEKING & EXPENDITURE (CONTINUED)

Respondent: Head of household or the spouse of the head of household

Please provide information on all members who usually reside in this household.

13.B. ILLNESS AND HEALTHCARE EXPENDITURE (CONTINUED)

Note: (Col. 11) treatment includes hospital and medicine expenditure.

ID NUMBER	In the last thirty days, how many times did [NAME] seek health care for illness, injury, or any other reason? If 0, PROBE. Has this person bought medicine or consulted with kru khmer, a traditional birth attendant, or a monk. Enter number of times sought. If '0' >> NEXT PERSON	In the past 30 days, which was the **first** provider that was consulted for [NAME]'s health? Enter Code (See below). If don't know enter '98'	**Ask if answer in Col. 8 is more** In the past 30 days, which was the last / most recent provider that was consulted for [NAME]'s health? Enter Code (See below). If don't know enter '98'	Was ..[NAME].. hospitalised for the treatment/ care during the last 30 days? 1 = Yes 2 = No. Include treatment/care in other countries. If '2' >> Col (10)	How many nights was .. [NAME].. hospitalised during the last 30 days? Include treatment/care in other countries. No of Nights	How much in total was spent on transport to go to and return from any health provider in the past 30 days? Include expenditure on transport to other countries. Write '0' if nothing. RIELS	How much in total was spent on treatment at any health provider in the past 30 days? Include expenditure for treatment/care in other countries. Write '0' if nothing. RIELS	How was the treatment financed? 1 = Household income 2 = Savings 3 = Borrowing 4 = Selling assets 5 = Selling household production in advance 6 = Other sources (specify). Enter the 3 with the highest amounts		
(1)	(8)	(9a)	(9b)	(9c)	(9d)	(10)	(11)	(12a)	(12b)	(12c)
01										
02										
03										
04										

- Health expenditure can be collected in the **health module**.

- In this example (**Cambodia Socioeconomic Survey**), the information is collected:
  - At the **individual** level.
  - Based on a **30-days recall period**.

How are health OOP expenditure measured?

No.	What was your household's expenditure on the following items during the indicated time periods? NON-FOOD ITEMS	Time period	Value (in Riels) Write '0' if nothing: In-cash expenditure	In-kind expenditure or gifts received	Total expenditure Col (4) + (5)
24	...spoon, fork, knife, broom, chobsticks	Last 6 months			
25	...gardens, plants and flowers (not for agriculture)	Last 6 months			
26	...pets and related costs	Last 6 months			
27	...toys, games and hobbies	Last 6 months			
28	...dwelling insurance and maintenance (excl. improvements)	Last 12 months			
C1E.	Health treatment and health service				
29	...drugs bought with prescription or over the counter	Last 1 month			
30	...medical products and assistive products	Last 1 month			
31	...medical or dental consultation without overnight stay	Last 1 month			
32	...medical or dental treatment with overnight stay	Last 6 months			
33	...traditional medicine	Last 6 months			
34	...health insurance	Last 12 months			

- Health expenditure can also be collected under **Non-Food items** in the **consumption expenditure module**.

- Here (same survey instrument), the information is collected:
  - At **household** level.
  - With a **recall period** varying depending on the expenditure item.
    - 1 month
    - 6 month
    - 12 month

- Analyzing total health OOP spending, or measures based on the health budget share requires **annualization of health expenditures**.

Health OOP spending measurement issues/concerns

- **Spending frequency**
  - Spending frequency may differ depending on health shock distributions, disease chronicity…
  - Spending frequency matters for policy design.
    - Insurance model (Ehrlich and Becker, 1972; Gill and Ilahi, 2000): Rarer/larger shocks influence the relative price of self vs market insurance.
- **Seasonality**
  - Seasonal disease burden will translate into seasonal health expenditure patterns.
  - Comparability between and within countries can be compromised.
- **Annualization**
  - Required to take seasonal effects into account, and to allow cross-country comparison when survey design are different, and recall periods expressed at different frequencies.

High-Frequency Phone Surveys

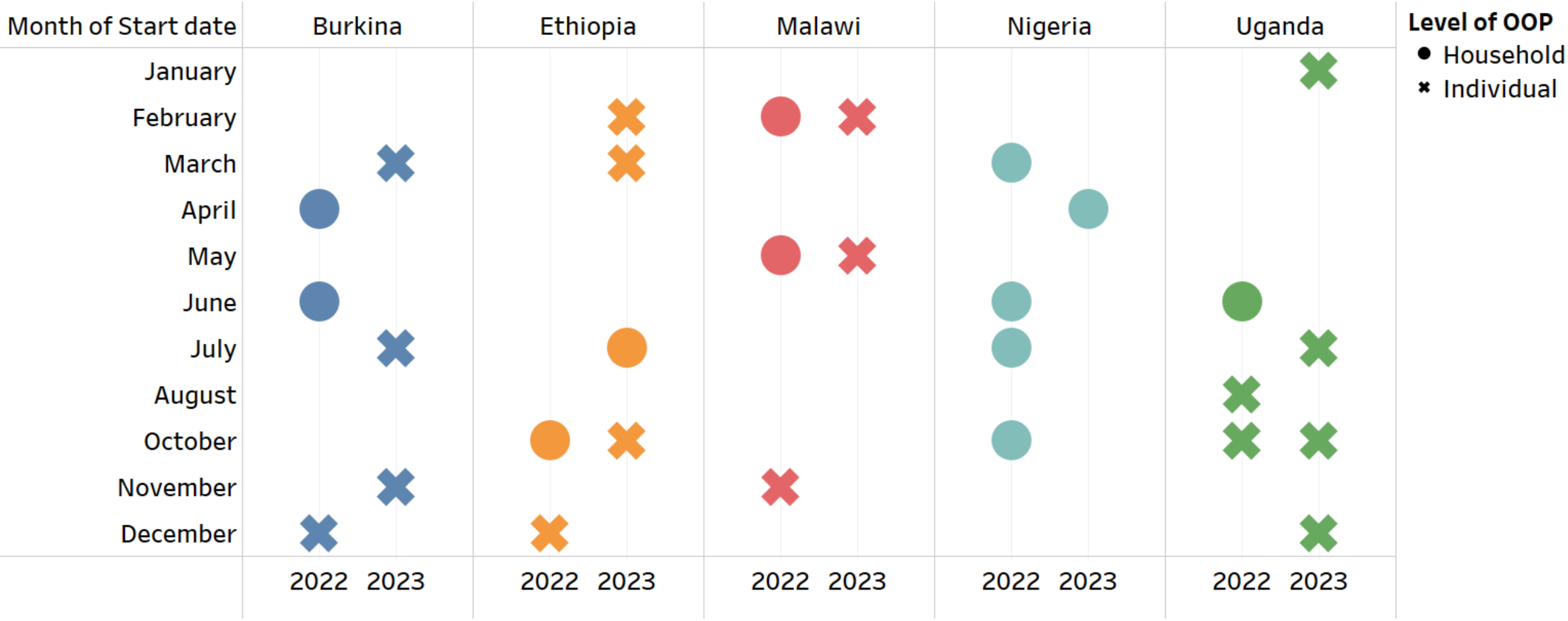
- The rollout of several rounds of (infra-annual) high-frequency phone surveys in developing countries during COVID-19 provided an opportunity to analyze:

  1. The **frequency of health spending** patterns across different countries.

  2. The **accuracy of naïve annualization methods**.

→ Do we need more frequent data to measure health OOP spending?

Data Collection Schedule



Health questionnaire

Section 5f. Access to Health Services

Instruction: read/don't read - 50/50

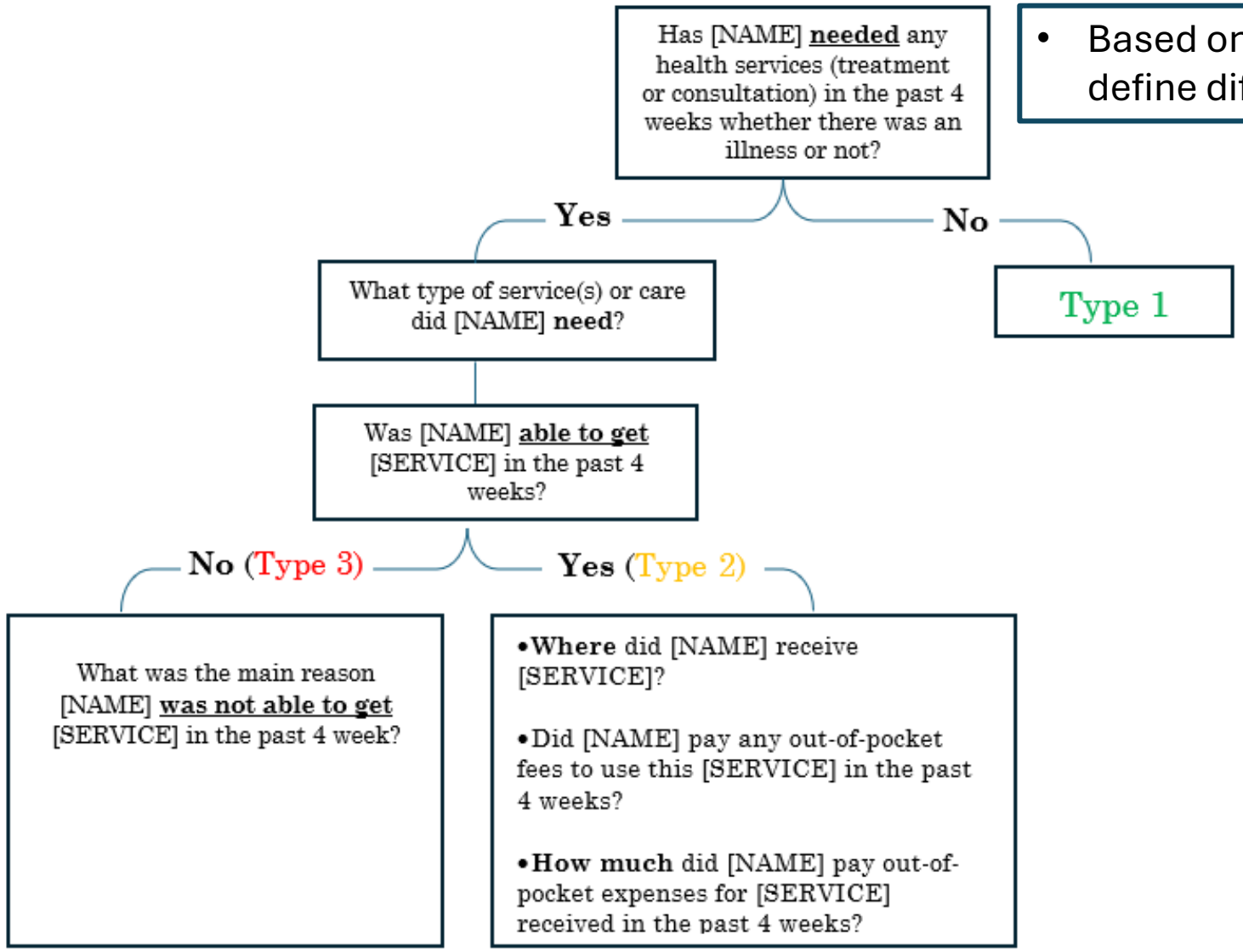
1.	2.	3.	4.
Are you or any member of your household currently covered by any health insurance? YES.1 NO..2 >> Q3	Who pays for the health insurance (partially or fully) of the household members? READ OPTIONS SELECT ALL THAT APPLY Employer - Government.....1 Employer - Non-Government Organization..2 Employer - Private business/company.....3 Community .....4 Private (individually acquired).....5 Other (Specify).....96	Have you or any member of your household needed any health services (treatment or consultation) **in the past 4 weeks** whether there was illness or not? YES ....1 NO ....2 >> NEXT SECTION	What type of service(s) or care did you or any member of your household need? READ ALL OPTIONS/DO NOT READ OPTIONS SELECT ALL THAT APPLY COVID-19 related service (screening/diagnostic test, vaccination, treatment).....1 Family planning services.....2 Vaccination services (non-COVID).....3 Maternal health/ pregnancy care.....4 Non-COVID Health Care for Household Members Less Than 5 Years Old.....5 Non-COVID Health Care for Household Members 5 Years and Older.....6 Emergency(non-COVID).....7 Pharmacy / Chemist services.....8 Other (SPECIFY).....96

4b.	5.	6.	7.
Who in the household needed the service? [LIST HOUSEHOLD MEMBER IDs FROM THE ROSTER FOR EACH SERIVCE]	Were you or the member of your household able to get [SERVICE] **in the past 4 weeks**? **ASK THE QUESTION FOR EACH DIFFERENT SERVICE MARKED "YES" IN Q4** YES ...1 >> Q7 NO 2	What was the main reason you or the member of your household were not able to get [SERVICE] **in the past 4 weeks?** **ASK THE QUESTION FOR EACH SERVICE MARKED "YES" IN Q4** **DO NOT READ OUT OPTIONS** LACK OF MONEY .....1 NO MEDICAL PERSONNEL AVAILABLE.....2 TURNED AWAY BECAUSE FACILITY WAS FULL .....3 TURNED AWAY BECAUSE FACILITY WAS CLOSED.....4 HOSPITAL/CLINIC NOT HAVING ENOUGH SUPPLIES OR TESTS...5 HEALTH FACILITY IS TOO FAR.....6 FEAR OF CONTRACTING CORONAVIRUS.....7 LOCKDOWN/TRAVEL RESTRICTIONS.....8 LACK OF TRANSPORTATION.....9 OTHER (SPECIFY) .....96 >> NEXT SECTION	Where was [SERVICE] received? **ASK THE QUESTION FOR EACH SERVICE MARKED "YES" IN Q4** HOSPITAL.....1 CLINIC/HEALTH POST.....2 PHARMACY.....3 CHEMIST SHOP (DRUG SHOP).....4 MATERNITY HOME/ MATERNAL AND CHILD HEALTH POST.....5 CONSULTANT'S HOME.....6 PATIENT'S OME...7 TRADITIONAL HEALER'S HOME....8 FAITH BASED HOME .....9 OTHER(SPECIFY)...96
Member ID | Member ID | Member ID			

8.	9.						
Did you, or any member of your household, have to pay out of your own pocket fees to use this [SERVICE] **in the past 4 weeks?** **ASK THE QUESTION FOR EACH SERVICE MARKED "YES" IN Q4** YES.1 NO..2 >> Q10	How much did your household pay out-of-pocket for [ITEM] for the [SERVICE] received in the past 4 weeks? **ASK THE QUESTION FOR EACH SERVICE MARKED "YES" IN Q4** **RECORD -9999 IF DON'T KNOW**						
	Examination /Medical visits	Prescription drugs or drugs recommended by a health professional	Non-prescription drugs obtained over-the-counter (without health professional recommendation)	Emergency (ambulance)	Non-emergency Transport	Other expenses (Specify)

- Need of service (whether there was illness or not) in the past 4 weeks.
- Information collected at individual/service level.
- Reasons for foregoing health care.
- Health OOP spending by spending category (exams, prescription/non-prescription drugs, transport…).

Spending types

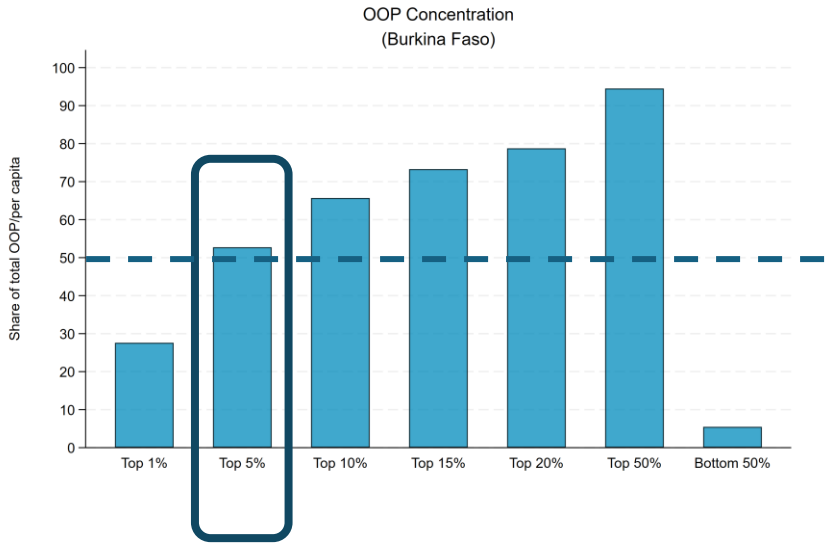


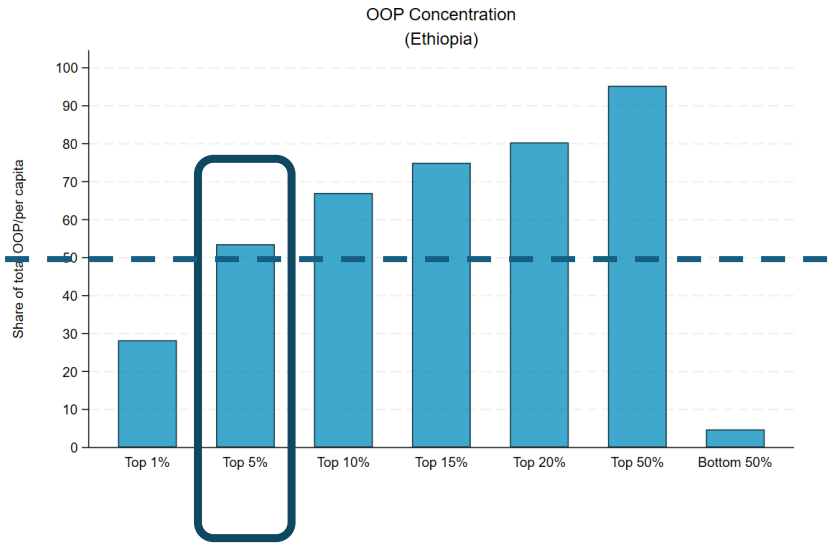
- Based on response patterns across survey rounds, we define different types of health spenders.

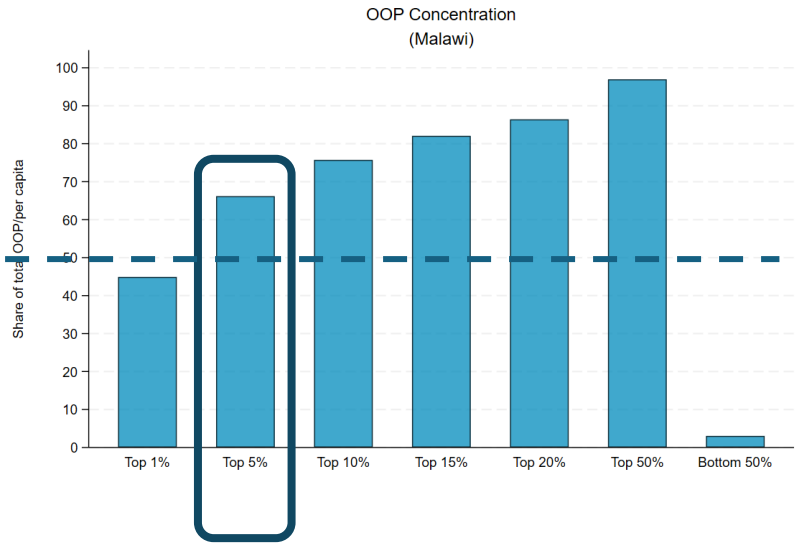
Type of access in each round
Type 1: No reported need
Type 2: Reported need and use
Type 3: Reported need without use

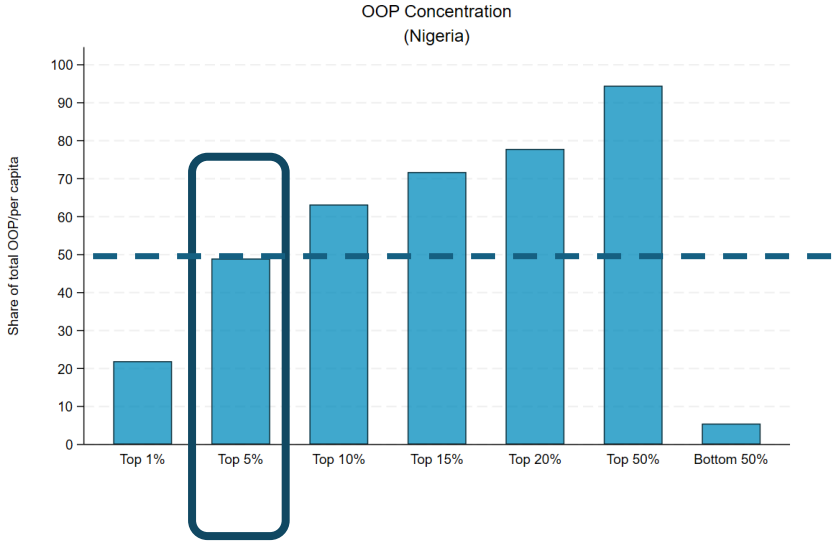
Type of spenders in all rounds
Frequent spender: Spent if needed (Type 2 in two or more) [other rounds can be Type 1 or 3]
Rare spender: Spent if needed (Type 2 in only one round) [other rounds can be Type 1 or 3]
Never spenders (with or without need) (Type 1 or Type 3 in all rounds)

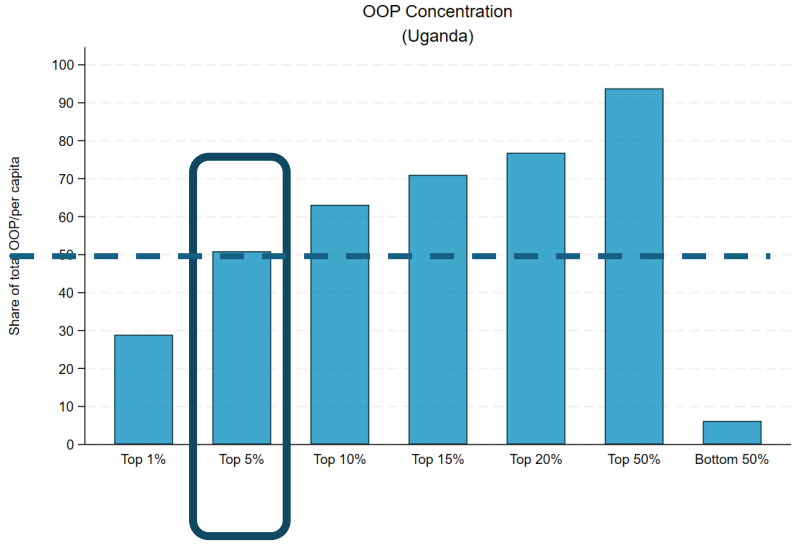
Health OOP Concentration





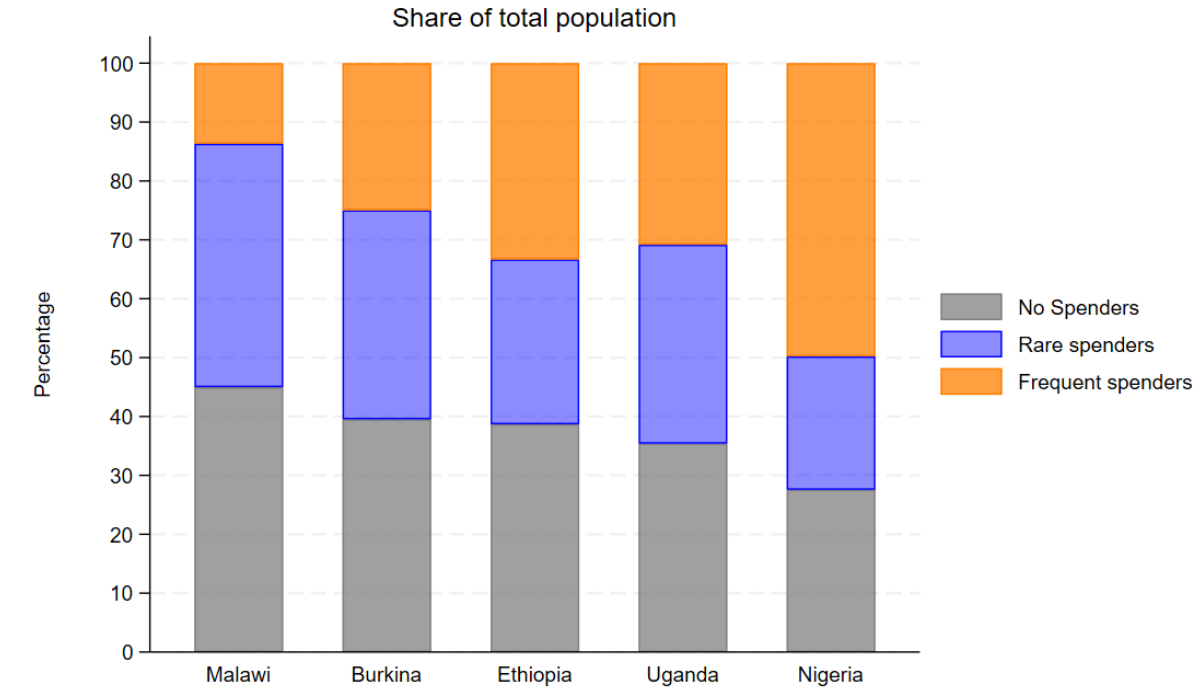




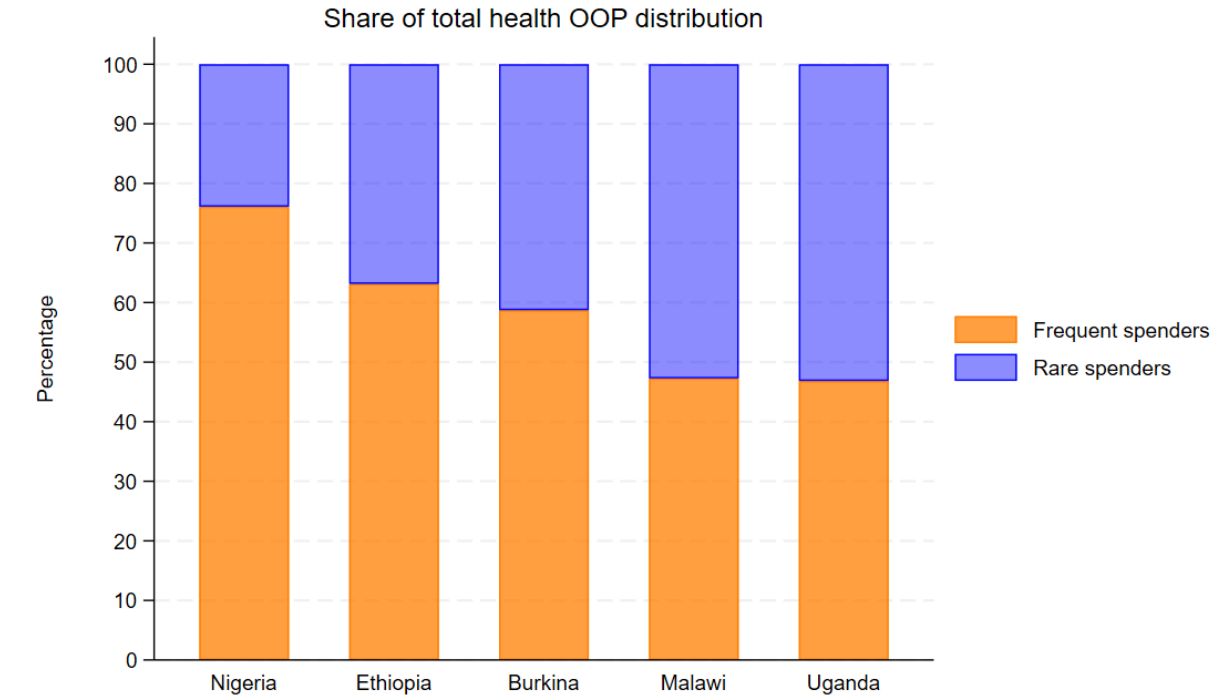


- Health OOP is heavily concentrated.
- In all 5 countries, the top 5% spenders account for at least 50% of total OOP (average per capita at household level).

Health OOP Concentration by Spender Type



Source: World Bank High Frequency Phone Surveys (2022-2023.)

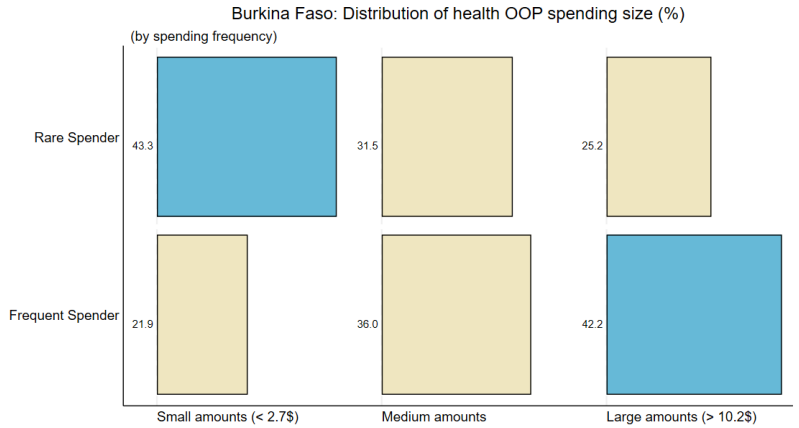


Source: World Bank High Frequency Phone Surveys (2022-2023.)

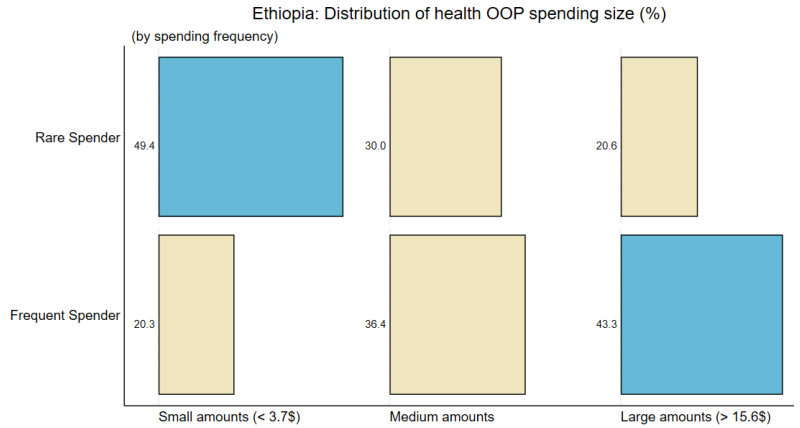
- **Frequent spending on health is not a rare event.**
- Households with at least one frequent spender member account for ~12% of the population in Malawi and for 50% of the population in Nigeria.

- Households with frequent spenders represent over 75% of all spenders in Nigeria and almost 50% in Malawi and Uganda.

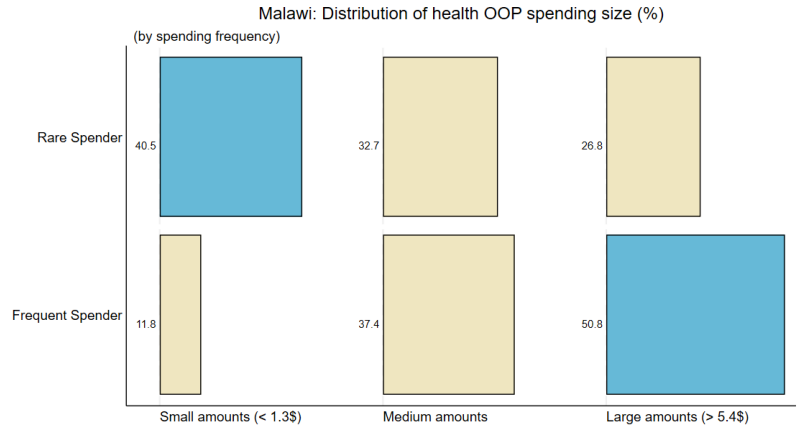
Health OOP Frequency and Spending Size



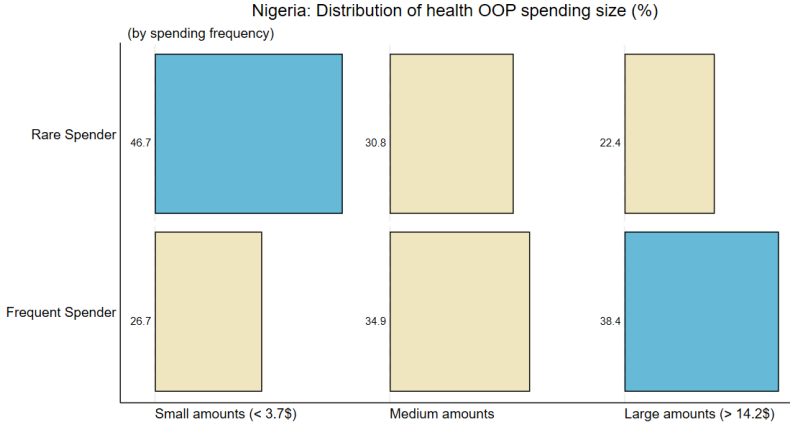
Source: Burkina Faso High Frequency Phone Survey (2022-23).
Note: Annualized health expenditure distribution estimated from panel data.
The categories for small/medium/large amounts are based on splitting the per capita annual distribution around the 33rd (2.7$) and 66th (10.2$) percentiles.



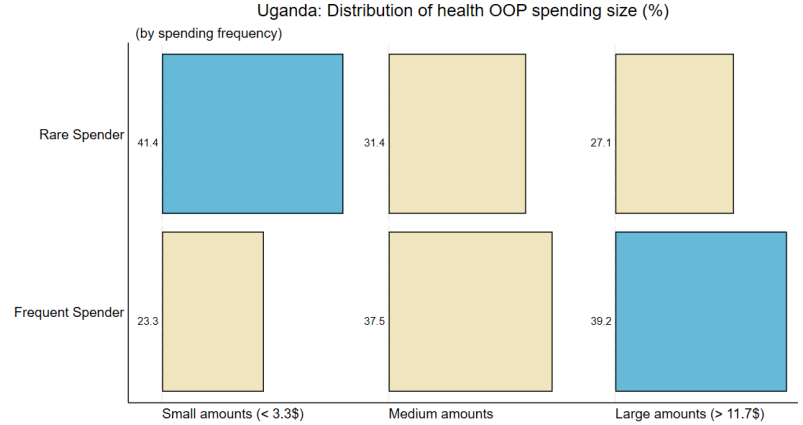
Source: Ethiopia High Frequency Phone Survey (2022-23).
Note: Annualized health expenditure distribution estimated from panel data.
The categories for small/medium/large amounts are based on splitting the per capita annual distribution around the 33rd (3.7$) and 66th (15.6$) percentiles.



Source: Malawi High Frequency Phone Survey (2022-23).
Note: Annualized health expenditure distribution estimated from panel data.
The categories for small/medium/large amounts are based on splitting the per capita annual distribution around the 33rd (1.3$) and 66th (5.4$) percentiles.



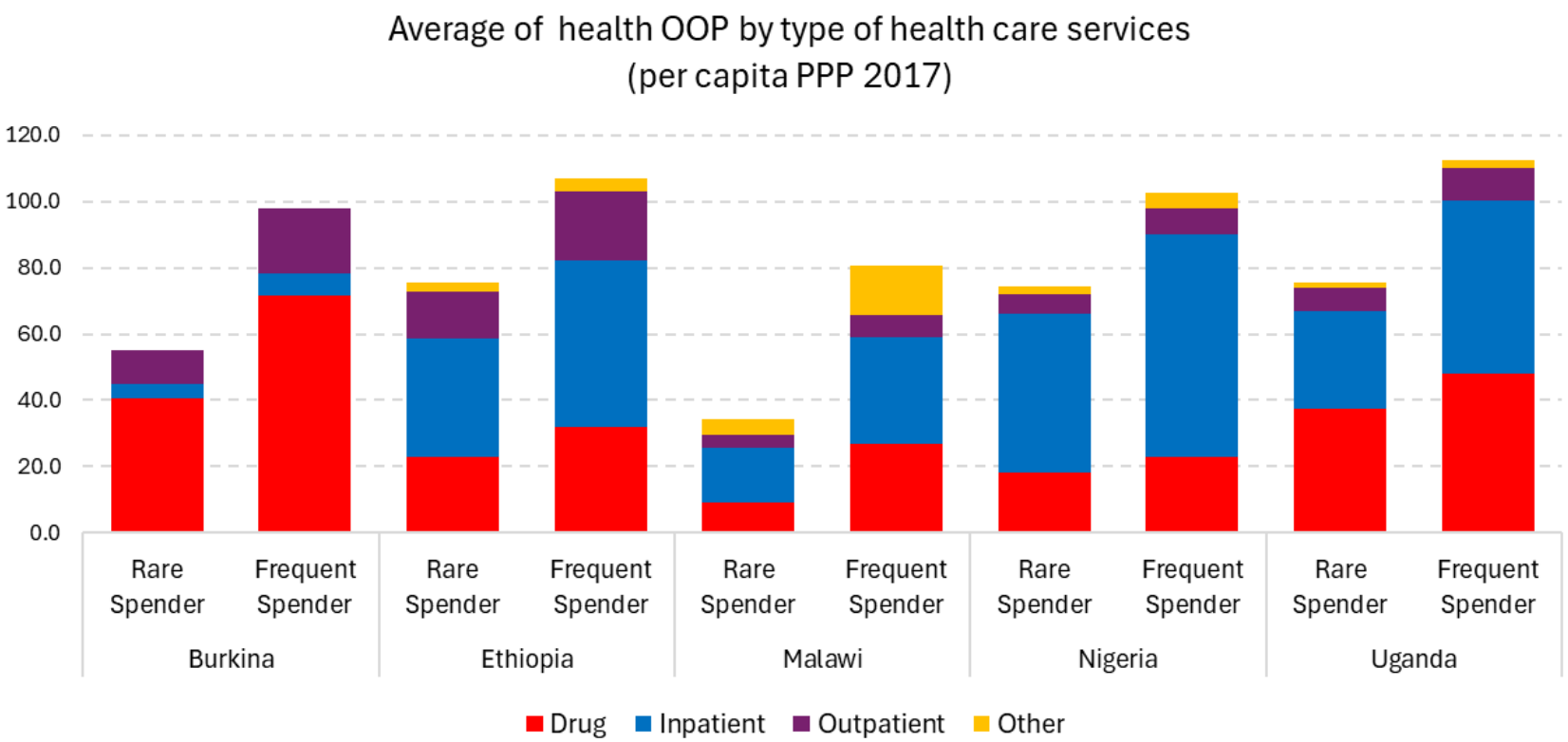
Source: Nigeria High Frequency Phone Survey (2022-23).
Note: Annualized health expenditure distribution estimated from panel data.
The categories for small/medium/large amounts are based on splitting the per capita annual distribution around the 33rd (3.7$) and 66th (14.2$) percentiles.



Source: Uganda High Frequency Phone Survey (2022-23).
Note: Annualized health expenditure distribution estimated from panel data.
The categories for small/medium/large amounts are based on splitting the per capita annual distribution around the 33rd (3.3$) and 66th (11.7$) percentiles.

- Frequent spenders are more likely to spend larger amounts on health, and rare spenders are more likely to spend lower amounts.

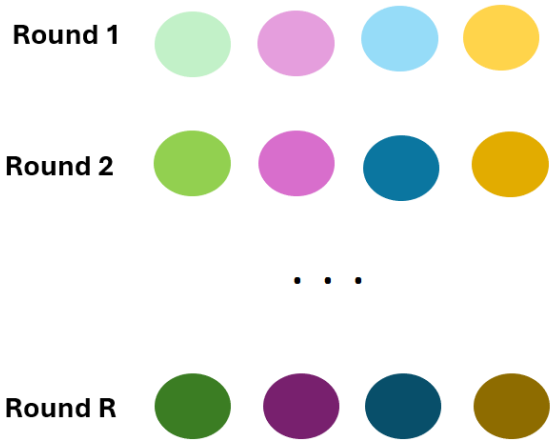
Health OOP Frequency and Composition



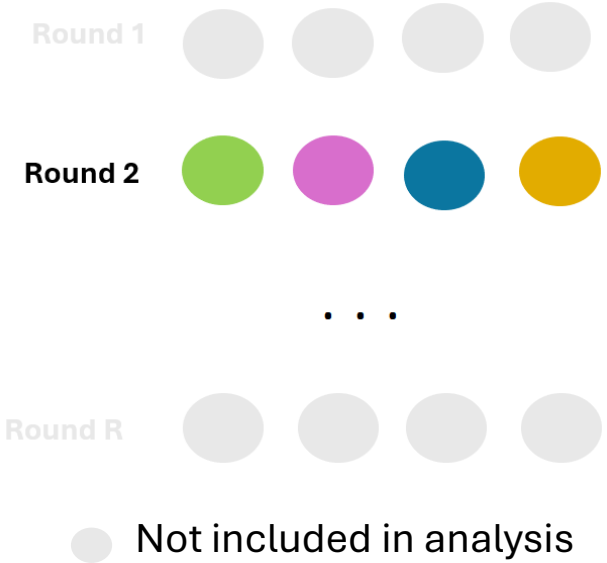
- Spending on **drugs**, and on **inpatient care** represent the majority of health OOP spending in all 5 countries covered in this study.

Annualization Comparisons

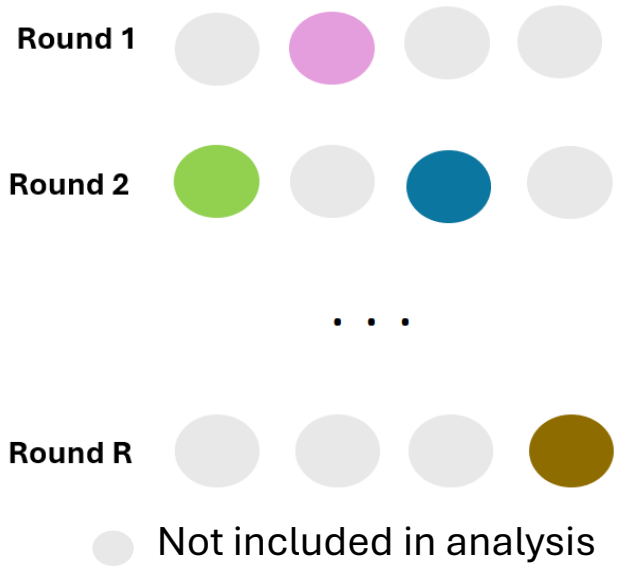
(i) Panel data approach (Benchmark)



(ii) Round-specific cross-sectional estimation



(iii) Pooled cross-sectional estimation with non-repeated households



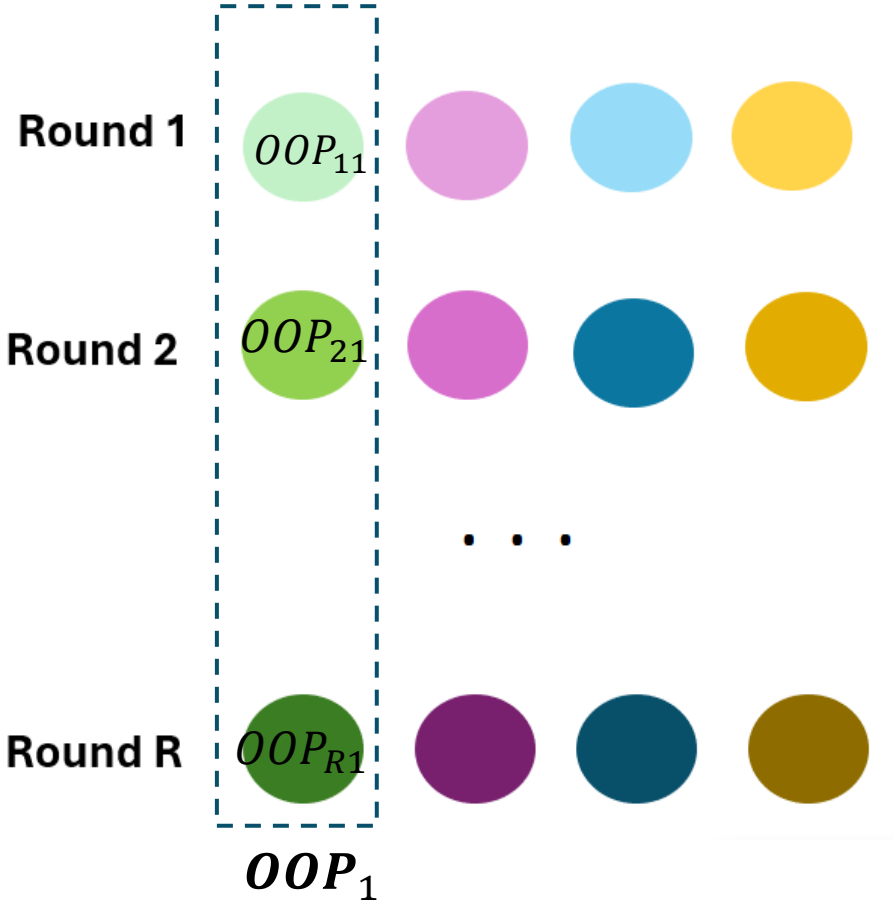
Annualization Comparisons

(i) Panel data approach:

$$OOP^{Panel} = \frac{1}{\sum_{j=1}^{N} w_j} \sum_{j=1}^{N} w_j OOP_j$$

$$OOP_j = \frac{12}{R} \sum_{r=1}^{R} OOP_{rj,}$$

Under the **panel approach** (benchmark), we first sum health spending across survey rounds, and we annualize the average spending amount/capita/round.

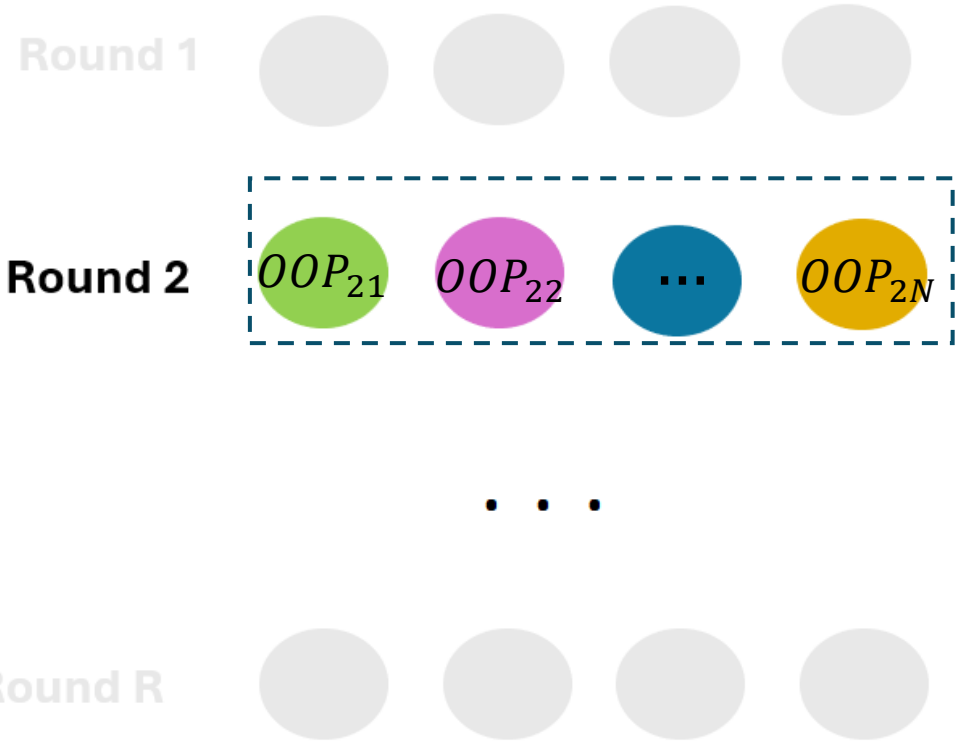


Annualization Comparisons

(ii) Round-specific cross-sectional estimation:

$$OOP_r^S = \frac{12}{\sum_{j=1}^{N_r} w_{rj}} \sum_{j=1}^{N_r} w_{rj}\, OOP_{rj}$$

Under the **round-specific CS approach**, we treat each round of data collection as an independent sample, and we annualize the health spending amounts.



Annualization Comparisons

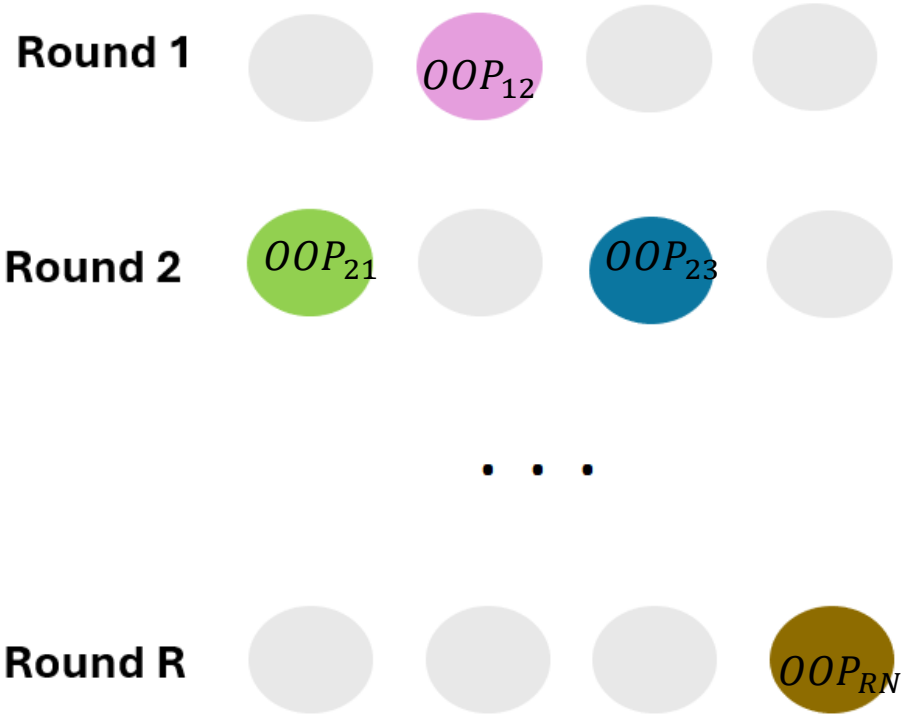
(iii) Pooled cross-sectional estimation with non-repeated households:

$$OOP_{Non-repeat}^{Pooled} = \frac{12}{\sum_{r=1}^{R}\sum_{j=1}^{\bar{N}_r} w_{rj}} \sum_{r=1}^{R}\sum_{j=1}^{\bar{N}_r} w_{rj}\, OOP_{rj}$$

Under the **pooled CS approach**, we also construct a cross-sectional dataset, but we select a subset of households from the panel data to appear only once.

Households are randomly distributed in specific cross sections such that:

- (1) each household is selected only once, and
- (2) the sample is distributed across all rounds of the panel.



Annualization Comparisons

		Burkina	Ethiopia	Malawi	Nigeria	Uganda
(i) Panel data	Sample Size*	2,377	2,735	1,367	2,785	1,870
	Rounds	4	5	3	4	3
	% of HH with OOP>0	64%	62%	54%	74%	63%
	Average of OOP per capita	36.05	47.29	17.27	65.41	54.07
	CV (OOP per capita)	0.05	0.05	0.07	0.04	0.05
	OOP drug share	85.56	43.37	28.7	38.32	63.33
(ii) Single independent cross-sectional estimation	Sample Size	2,023	2,479	1,310	2,571	1,457
	% of HH with OOP>0	30%	31%	28%	47%	50%
	Average of OOP per capita	36.4	37.5	27.5	63.54	72.57
	CV (OOP per capita)	0.08	0.09	0.09	0.05	0.07
	OOP drug share	81.55	45.8	25.2	41.51	62.74
(iii) Pooled Cross-sectional estimation with non-repeated households	Sample Size	2,377	2,735	1,367	2,785	1,870
	% of HH with OOP>0	34%	29%	24%	45%	41%
	Average of OOP per capita	36.45	48.72	17.52	65.54	55.88
	CV (OOP per capita)	0.08	0.16	0.13	0.06	0.07
	OOP drug share	86.63	43.15	29.89	39.75	65.05

*: In (i) Panel, we collect data r times (number of rounds). CV: Coefficient of Variation. (See Annex table 3). Monetary values are based on 2017 PPP factors. Summary statistics of average OOP are provided in Annex Table 3 by rounds.

[Extensive margin] The share of households reporting any health spending is higher when we rely on panel data.

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	CV (OOP per capita)	0.08	0.16	0.13	0.06	0.07
	OOP drug share	86.63	43.15	29.89	39.75	65.05

*: In (i) Panel, we collect data r times (number of rounds). CV: Coefficient of Variation. (See Annex table 3). Monetary values are based on 2017 PPP factors. Summary statistics of average OOP are provided in Annex Table 3 by rounds.

[Intensive margin] Average spending per capita (population level) differs in some cases.

Annualization Comparisons

		Burkina	Ethiopia	Malawi	Nigeria	Uganda
(i) Panel data	Sample Size*	2,377	2,735	1,367	2,785	1,870
	Rounds	4	5	3	4	3
	% of HH with OOP>0	64%	62%	54%	74%	63%
	Average of OOP per capita	36.05	47.29	17.27	65.41	54.07
	CV (OOP per capita)	0.05	0.05	0.07	0.04	0.05
	OOP drug share	85.56	43.37	28.7	38.32	63.33
(ii) Single independent cross-sectional estimation	Sample Size	2,023	2,479	1,310	2,571	1,457
	% of HH with OOP>0	30%	31%	28%	47%	50%
	Average of OOP per capita	36.4	37.5	27.5	63.54	72.57
	CV (OOP per capita)	0.08	0.09	0.09	0.05	0.07
	OOP drug share	81.55	45.8	25.2	41.51	62.74
(iii) Pooled Cross-sectional estimation with non-repeated households	Sample Size	2,377	2,735	1,367	2,785	1,870
	% of HH with OOP>0	34%	29%	24%	45%	41%
	Average of OOP per capita	36.45	48.72	17.52	65.54	55.88
	CV (OOP per capita)	0.08	0.16	0.13	0.06	0.07
	OOP drug share	86.63	43.15	29.89	39.75	65.05

*: In (i) Panel, we collect data r times (number of rounds). CV: Coefficient of Variation. (See Annex table 3). Monetary values are based on 2017 PPP factors. Summary statistics of average OOP are provided in Annex Table 3 by rounds.

[Spending composition] The share of OOP going to drugs seems to differ marginally depending on how we annualize.

Annualization Comparisons

		# of statistically significant differences (Independent cross-section (ii) vs panel estimates (i))		
	Total # of comparisons (n)	OOP per capita (population estimate)	OOP per capita (spenders only)	Share of drug spending
Total	*19*	*7*	*19*	*10*
Burkina	4	1	4	4
Ethiopia	5	0	5	1
Malawi	3	2	3	2
Nigeria	4	2	4	2
Uganda	3	2	3	1
RMSE as % mean*		175.2	6898.4	34.2
Average of MAE**		53.2	94.7	13.7
Average of MAPE***		111.2	121.4	151.8

*RMSE (Root Mean Squared Error): $\sqrt{\frac{1}{n}\sum_{i=1}^{n}(OOP_{panel(i)} - OOP_{Cross\ (ii)})^2}$. To compute RMSE as % mean, the RMSE divided by average of OOP from Panel.

**MAE (Mean Absolute Error): $\frac{1}{K}\sum_{k=1}^{K}|OOP(i)_k - OOP(ii)_k|$

*** MAPE (Mean Absolute Percentage Error): $\frac{100}{K}\sum_{k=1}^{K}\frac{|OOP(i)_k - OOP(ii)_k|}{OOP(i)_k}$

- We systematically compare whether our variables of interest differ between the single cross-sectional approach and the panel estimate across all comparisons.
- If we focus on **average OOP per capita across the entire population**, a naïve annualization based on a single cross-section is statistically different from the analog amount estimated using infra-annual panel data about 37% of the time.
- The difference in estimation is larger if we are interested in **average OOP spending per capita among the spenders only**.
- The estimation of **OOP composition** also differs over half of the time.

Annualization Comparisons

# of statistically significant differences (Pooled cross-section (iii) vs panel estimates (i))				
	Total # of comparisons (n)	OOP per capita (population estimate)	OOP per capita (spenders only)	Share of drug spending
Total	*100*	*3*	*100*	*9*
Burkina	20	0	20	2
Ethiopia	20	0	20	0
Malawi	20	3	20	1
Nigeria	20	0	20	5
Uganda	20	0	20	1
RMSE as % mean*		25.4	6591.8	6.2
Average of MAE**		48.4	86.2	12.5
Average of MAPE***		106.5	112.0	128.2

*RMSE (Root Mean Squared Error): $\sqrt{\frac{1}{n}\sum_{i=1}^{n}(OOP_{panel(i)} - OOP_{Cross\ (ii)})^2}$. To compute RMSE as % mean, the RMSE divided by average of OOP from Panel.

**MAE (Mean Absolute Error): $\frac{1}{K}\sum_{k=1}^{K}|OOP(i)_k - OOP(ii)_k|$

*** MAPE (Mean Absolute Percentage Error): $\frac{100}{K}\sum_{k=1}^{K}\frac{|OOP(i)_k - OOP(ii)_k|}{OOP(i)_k}$

- Comparing **seasonally-adjusted cross-sections** with panel data produces closer estimates of **average OOP per capita for the entire population**.
- Comparisons of **OOP composition** (share of drugs) also remain within reasonable bounds and differ less than 10% of the time.
- **Average OOP per capita among the spenders only** remain however systematically different.

Discussion

Collecting high frequency data (infra-annual) on health expenditure seems to matter for at least two reasons:

Measurement

More reliable population-level estimation of health OOP annual volume and composition (especially if we want to estimate average spending among the spenders)

Policy

More granular characterization of health spenders.

- Across the 5 countries covered in this study, total health OOP spending is heavily concentrated with frequent spenders accounting for a large proportion of health OOP expenditure, because they spend more often and because they spend more.
- Allows better targeting for health insurance schemes and for benefit package design.
- Optimal risk sharing strategies will depend on the frequency and the size of the risk distribution.

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Survey Design

- Conducting high-frequency data collection at country level should also consider:
  - Data collection costs
  - Sampling frame/attrition
  - Mode effects (phone surveys)
  - Possibility to integrate high frequency data with larger/lower frequency datasets

Conclusion

What we did

- Leverage high-frequency phone survey data in 5 African countries to:
  - Assess the reliability of naïve annualization approaches to estimate the level and the composition of health OOP.
  - Characterize the frequency of health spending.

What we found

- Naïve annualization methods are not always accurate in estimating population level health OOP spending, and seasonality needs to be taken into account for health spending measurement.
- Health spending is heavily concentrated, and a large proportion of spending is borne by frequent spenders who spend larger amounts on health.

Implications for measurement

- Given their relatively lower cost, high-frequency phone survey should be considered as useful complements to larger face-to-face data collection efforts for the measurement of health spending and UHC.
- Further work may be needed to assess mode effects and survey design considerations.

Implications for policy

- Better understanding of the longitudinal distribution of health spending risks has implication for health insurance targeting and benefit package design.
- Optimal risk sharing policies will depend on the frequency and size of the health spending distribution.

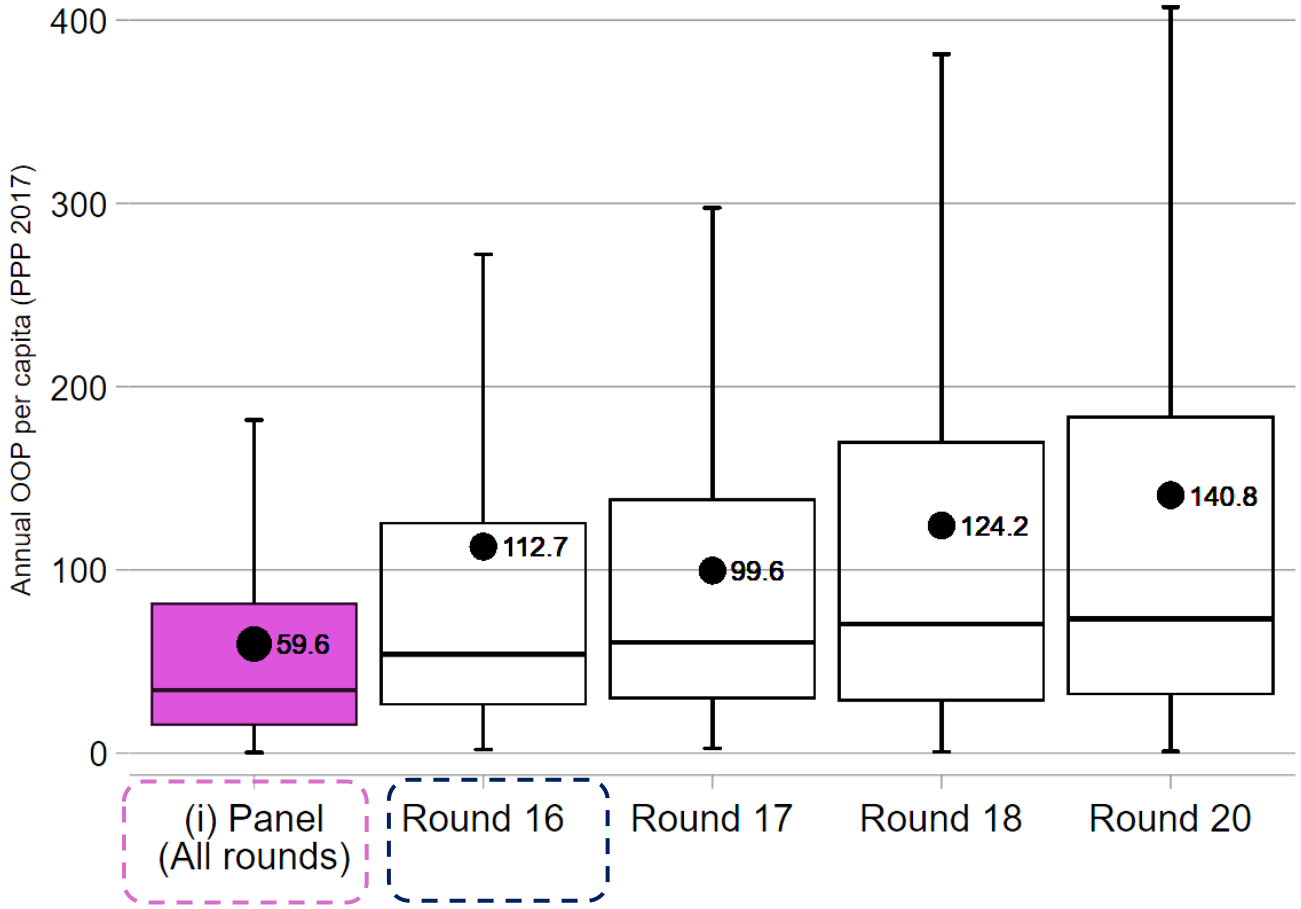
Appendix

Sample characteristics

Country	Burkina	Ethiopia	Malawi	Nigeria	Uganda
1. Sample					
Number of rounds in our analysis	4	5	3	4	3
Average of sample size (Households)	1,809	2,354	1,339	2,568	1,560
Average of response rate	90.9	98.4	79.9	90.4	88.6
Rate of attrition (last round from first round)	14.0	-10.4	-1.8	-7.0	-18.6
% of households with response					
In only one round	5.4	4.4	1.6	3.1	15.1
At least 50% of rounds	94.6	89.7	98.4	96.9	84.9
At least 80 % of rounds	52.8	81.5	95.5	79.6	65.5
% All rounds (100%)	52.8	63.7	95.5	79.6	65.5
At least 80% of rounds by factors					
Urban	59.9	84.0	95.2	85.1	68.6
Rural	43.3	76.3	95.6	75.9	64.5
with 1 member	63.2	79.8	98.0	79.5	50.0
with 2-3 members	53.5	84.2	95.6	80.7	68.8
with 4-6 members	55.8	81.7	95.1	80.0	65.9
more than 6 members	49.2	78.5	95.9	78.8	65.9
HH head (>=60)	49.7	77.9	93.4	80.1	65.8
HH head (<60)	53.8	82.1	96.2	79.5	65.4
Q1(Poorest)	35.5	70.9	95.9	67.1	64.8
Q5(Richest)	63.8	83.9	95.5	86.1	69.5
2. Demographic statistics					
% of households in:					
Urban	57.4	67.2	36.9	40.1	24.3
Rural	42.5	32.8	63.1	59.9	75.7
with 1 member	2.9	6.1	3.7	4.2	5.1
with 2-3 members	10.3	22.2	20.0	15.7	13.4
with 4-6 members	42.2	49.9	55.1	40.3	45.6
more than 6 members	44.7	21.8	21.2	39.8	35.9
Female head	15.9	30.0	20.1	18.3	29.5
Male head	84.1	70.0	78.3	81.7	69.3

- Looking at some of the sample characteristics:
  - **Average response rates** for the health module is relatively high (>90%) except in Malawi (80%) and Uganda (89%).
  - **Attrition rates** (from first to last round of data collection) ranged between 2% (Malawi)-19% (Uganda). Additional households were added to the sample during the last round in Burkina.
  - **Household characteristics**
    - Overall, the sample was relatively more urban in Burkina and Ethiopia, and more rural in Malawi, Nigeria, and Uganda).
    - "Panel" households are more likely to be urban households in most countries, except in Malawi where they are equally likey to be rural.

Average of OOP from Round-specific cross-sectional (ii) is higher comparing Panel approach (inclusion of all rounds): Significantly higher in all countries (among spenders)



For each household, annual OOP is:

From Panel:

Annual OOP= $[(OOP_{16} + OOP_{17} + OOP_{18} + OOP_{20}) * \mathbf{12}]/\mathbf{4}$

From Round 16:

Annual OOP=OOP_{16}*12

.....

Multiplying by 12 produce a higher value of OOP for each household (and accordingly in average)